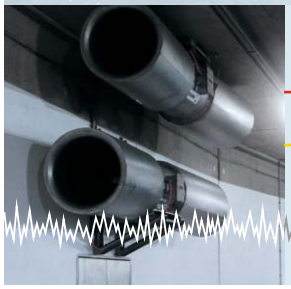
Vibration monitoring: monitoring your machine's pulse with precision.

Vibration monitoring

ifm.com/gb/octavis

Systems for vibration monitoring. The optimum solution for every requirement.



Vibration monitoring

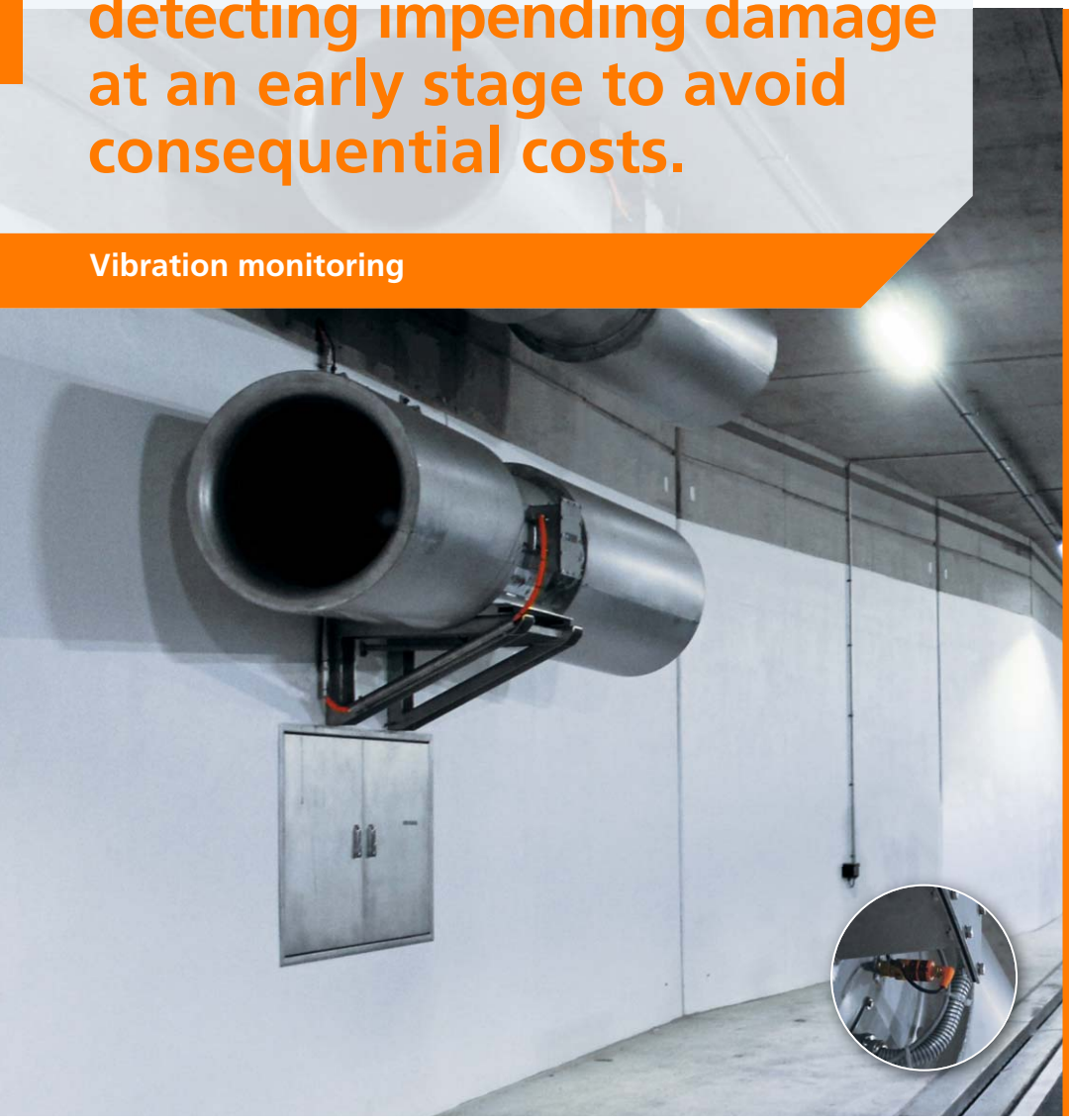
Condition monitoring

Machine protection
Process monitoring

System setup
Product overview

Trend monitoring: detecting impending damage at an early stage to avoid consequential costs.

Vibration monitoring



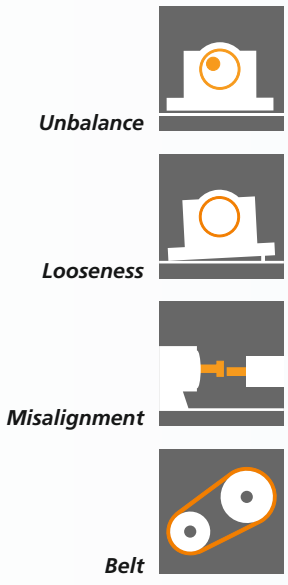
Simple:
monitoring of the overall status of the machine

Standardised:
compliant to ISO 10816

Safe:
protection against machine damage

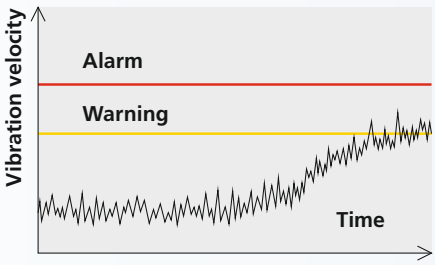
Flexible:
easy integration in the application

Reliable:
longer uptime



Machine protection and remote maintenance.

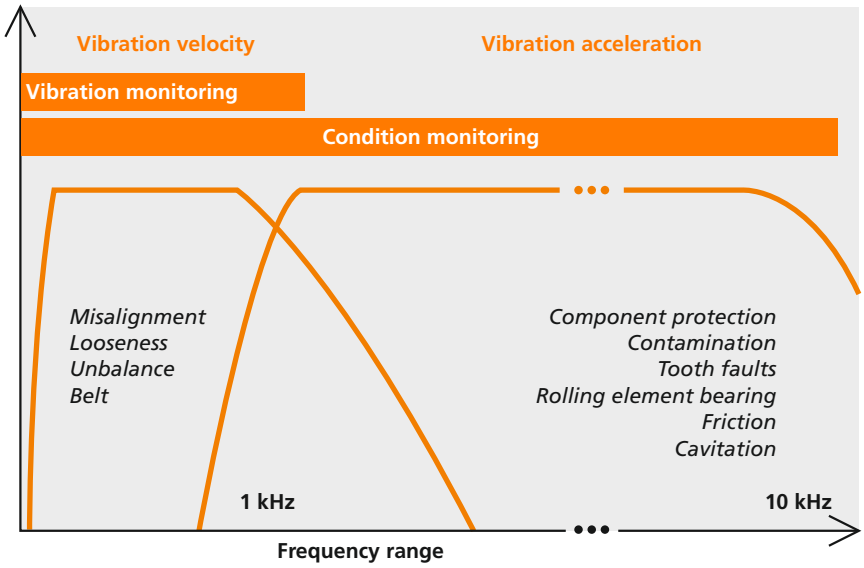
The monitoring of wind power gear boxes or pumps in the water supply concerning wear and stress makes it possible for the operator to organise efficient maintenance.
Alarm outputs serve to protect the system, to trigger remote maintenance and to facilitate targeted anlysis.



Trending of the machine vibrations to ISO 10816

What vibration reveals about machine health.

Even if in peak condition, all machines generate vibrations during operation. However, due to unbalance, misalignment or looseness, these vibrations will increase to a level that will have a negative effect on the functionality and service life of the machine. The ISO 10816 standard defines precise vibration limit values for industrial machines that can be used to assess the machine condition from new to critical. With ifm's product portfolio, the vibration behaviour can be monitored precisely and according to your requirements. Even only slightly increased vibration velocities will be detected and signalled. This is how impending defects can be detected and remedied at an early stage to avoid expensive damage and downtime.



Wireless vibration sensor type VW

Battery-powered vibration sensor for intermittent measurement of the overall vibration of simple machines. Requires a suitable gateway.

Basic vibration sensor type VK

Switching output and transmitter function. Response delay avoids triggering at start-up.

Basic vibration transmitter type VT

Simple transmitter function, 4...20 mA.

Intelligent vibration sensors type VV

Efficient condition monitoring for simple machines via IO-Link. Detects and analyses various process values internally for early damage detection.

Intelligent vibration sensors type VN

4-digit alpha-numeric display with colour change, history memory with real-time clock, analogue and switching output or 2 switching outputs.

Acceleration sensors VSA / VSP type

Robust acceleration sensors type VSA or VSP (or intrinsically safe VSP0xA) for connection to the VSE diagnostic electronics.

Diagnostic electronics type VSE

4-channel diagnostic module with additional process value inputs, integrated history memory, networking possible.

Monitor vibration velocity

The vibration sensors VK / VT / VW monitor online the overall vibration condition of machines and plants according to ISO 10816. The sensor measures the rms vibration velocity on a non-rotating component surface and triggers an alarm if the machine vibrations are too strong.

Simple sensor setting:
ifm.com/gb/setting-guide

Acting rather than reacting: increase availability, reduce maintenance costs, assure quality.

Condition monitoring

Safe:
permanent condition monitoring of critical machines

Anticipate:
machine diagnosis for early damage detection and avoidance of serious consequential damage

Optimise:
maintenance actions can be planned

Long service life:
make optimum use of the residual life of components

Economical:
make production processes transparent – meet TCO (total cost of ownership) concepts

Precise:
Counters detect values such as exposure time and machine uptime and support production based on key indicators.


Looseness


Unbalance


Misalignment


Friction


Rolling element bearing


Impact


Tooth faults


Belt


Cavitation


Contamination

Monitor up to 4 measurement points.

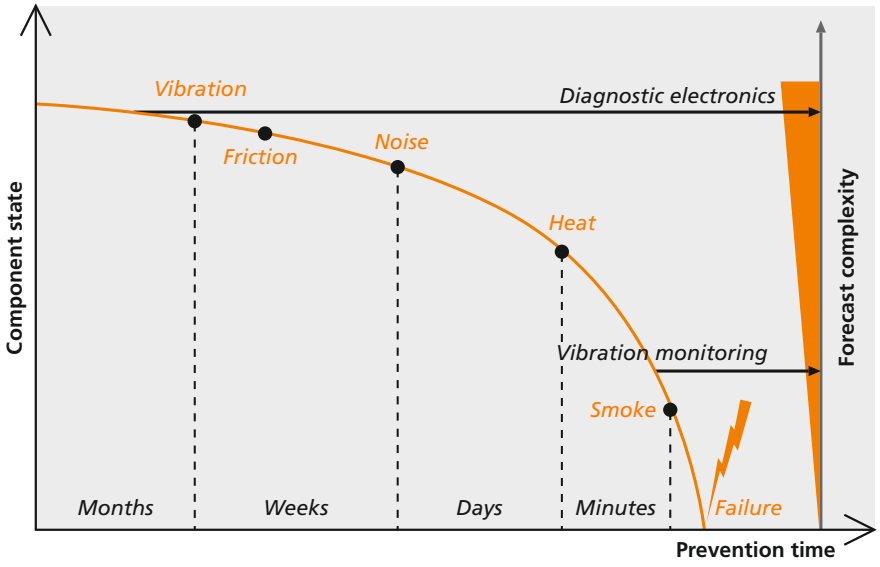
With the sensor type VSA / VSP machine vibrations can also be measured at inaccessible places.
Up to 4 measuring points can be monitored and documented with the diagnostic electronics type VSE. The Ethernet and fieldbus interfaces simplify networking and remote diagnostics.

Detect vibration and shocks at an early stage

Undetected unbalance, misalignment or bearing damage lead to unexpected failures and shorter service lives. The VV sensor detects the main indicators of impending machine damage. Triggered raw data acquisition (BLOB) enables further analyses.

The most efficient way to avoid unplanned downtime

With condition-based monitoring, imminent machine damage can be detected at an early stage. This enables predictive maintenance planning, which in turn allows for consistent product quality and the associated efficient use of resources. The vibration products from ifm reliably detect and evaluate vibration data. This is how the current machine status is transmitted to the controller or the IT infrastructure as a status value and, if necessary, as a warning or alarm signal. Counter functions also facilitate the calculation of component lifetimes influenced by the frequency and intensity of impacts, temperature or speed.



Intelligent vibration sensors type VN

On board display, history storage for documentation, for rotating machines >120 rpm.

Intelligent vibration sensors type VV

Detection of numerous vibration parameters with optional raw data acquisition (BLOB) for extended analyses as well as integrated machine uptime detection based on the vibration values.

Acceleration sensors type VSA / VSP / VSM

Different types, also for mounting in difficult to access areas. Various measuring ranges with voltage output (100 mV/g) or current loop (0...10 mA). Connection to the VSE diagnostic electronics.

Intrinsically safe acceleration sensor type VSP0xA

For the measurement of vibration in hazardous areas. Connection to the VSE diagnostic electronics installed outside the ATEX zone via a barrier.

Diagnostic electronics type VSE

4-channel diagnostic module with additional process value inputs, integrated history memory, networking possible.

Vibration diagnosis on a mixing tool.

Unplanned standstills of critical machines cause huge cost. Permanent condition monitoring of the whole plant makes it possible to act with foresight and to optimise the process.

Our solution for condition monitoring of machines.

ifm.com/gb/condition-monitoring

Measuring forces: minimise scrap and consequential damage to machine tools.

Machine protection / process monitoring

Dynamic:
monitoring of dynamic forces, e.g. in milling processes

Fast:
response times of 1 ms

Safe:
machine, tools and workpieces are protected against expensive consequential damage

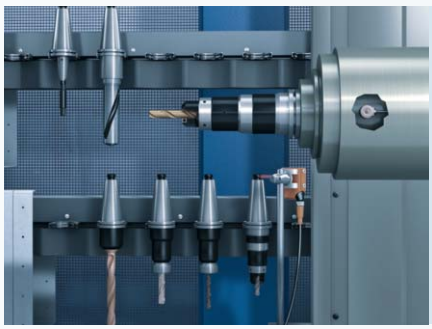
Preventive:
early condition monitoring avoids unplanned failures

Integrated:
direct connection to the machine control via a fieldbus interface

Protection of machine components

Workpiece protection

Tool protection



Detect unusual vibrations.
The micromechanical acceleration sensor type VSA is screwed into the housing of the spindle and detects even the most subtle changes of the vibration behaviour. The sensor withstands even fast movements and high forces without problems.

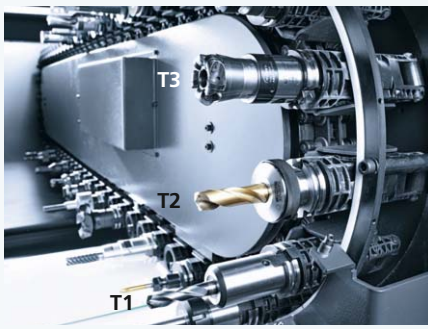


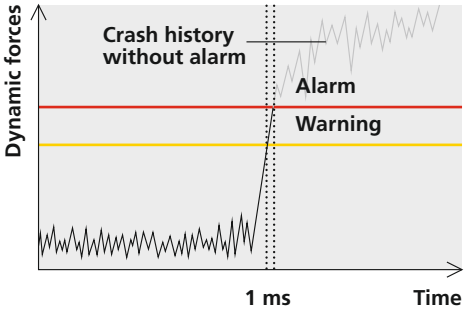
Photo source: DMG / MORI SEIKI
www.dmgmoriseiki.com

Monitor spindle vibration, avoid standstills.

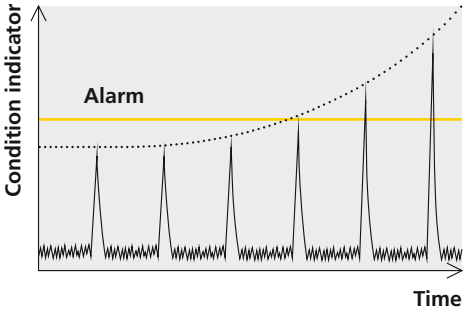
Incorrect settings and process parameters as well as incorrectly selected or defective tools can quickly have far-reaching consequences: The spindle and workpiece may crash, the spindle may be permanently overloaded, or the manufacturing quality may be insufficient or the workpiece may be damaged. The resulting unplanned downtimes and increased rejects reduce plant efficiency and cause unnecessary costs.
These costs are unnecessary because damage to the machine tool and workpiece can be efficiently prevented.

Through permanent monitoring and diagnostic of the spindle's vibration behaviour, collisions or excessive cutting forces will be detected within a millisecond and a corresponding switching signal will be output.

The integration of the vibration monitoring via the fieldbus interface into the machine control ensures optimum evaluation adapted to the current operating status. For example, individual alarm thresholds can be defined for different tools. This ensures that the machine will shut down reliably or change to a safe state before serious damage or downtime will occur.



Machine protection: spindle collision detectable in 1 ms



Trending in a stamping process

Acceleration sensors type VSA / VSM

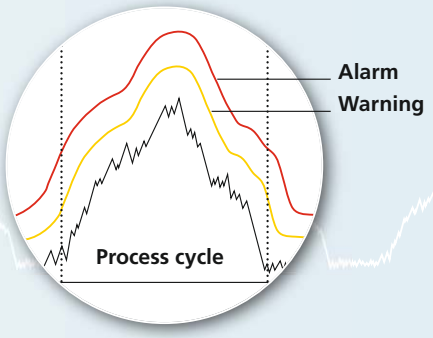
Trouble-free operation in the event of fast movement or influence of high forces. Integrated self-test for permanent safety.

Diagnostic electronics type VSE

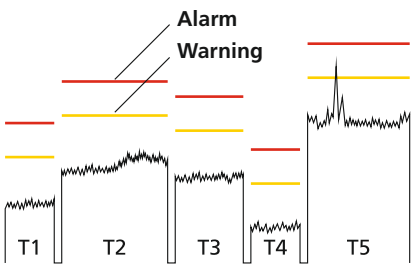
Frequency-selective monitoring, history memory with real-time clock, counter function, network capability TCP/IP.

Diagnostic electronics type VSE15x

Frequency-selective monitoring, history memory with real time clock, counter function, network capability TCP/IP, interface for the most common fieldbuses



Adaptive limit value consideration



Avoid consequential damage to machine tools.

Changes in the cutting forces as caused by blunt tooling or swarf jam will be detected on the basis of the changed vibration characteristics. Each tool can be assigned individual tolerance limits e.g. a warning and switch-off threshold Damage to the workpiece is reliably prevented.

Systems for vibration monitoring. Suitable products for all applications.

Wireless vibration sensors

For intermittent monitoring of the overall vibration condition of machines and equipment according to ISO 10816.

VW

Basic vibration sensors and transmitters

For permanent monitoring of the overall vibration condition of machines and equipment according to ISO 10816.

VT

VK

Intelligent vibration sensors

For measuring the overall vibration according to ISO 10816 or as a condition monitoring solution for simple machines.

VN

Vibration sensor with IO-Link

Enables real-time monitoring of the four categories of machine failure: impact, fatigue, friction and temperature.

VV

Diagnostic electronics

4-channel diagnostic system for the evaluation of dynamic signals, with additional analogue inputs.

VSE

VSE 15x

Acceleration sensors

Provide the measured machine body sound as a raw signal for downstream vibration monitoring or diagnostics.

VSA
VSP
VSM

Accessories

Software: VES & APA tool

Software for parameter setting and online data monitoring of the intelligent vibration sensors and diagnostic electronics.

For industrial applications

Physical interfaces								Condition monitoring capabilities						
Analogue output	Switching output	Signal input (e.g. 4...20 mA)	TCP / IP	Fieldbus	IO-Link	Wireless	Display / status LEDs	ISO 10816 (v-RMS)	Broadband monitoring + acceleration	Narrow band analysis / FFT	Temperature	Internal trending	Counters
					✓		✓			✓			
✓							✓						
✓	✓					✓	✓						
✓	✓	✓				✓	✓	✓			✓		
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✓	✓	✓	✓			✓	✓	✓	✓		✓	✓	
✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	
✓													

OPC server software VOS

To connect the vibration diagnostics to higher-level systems (SCADA, MES, ERP).

Accessories / connection technology

A wide product range of connection technology (e.g. sockets, Y-cables) and adapters makes it easy to implement the sensors.

moneo: IIoT platform

www.moneo.ifm

Nothing convinces more than practice: successful use of vibration diagnostics.

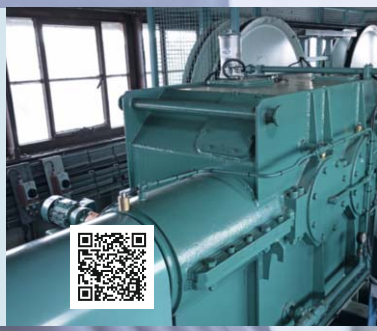
Application reports

Scania

The Swedish vehicle manufacturer Scania is one of the world's largest manufacturers of utility vehicles. The plant in Stockholm produces, among other things, powerful engines for trucks and buses.
Vibration sensors are monitoring the automated production.

Smart lock in Eefde

World Class Maintenance – The highest standards in all corporate sectors lead to an improvement of all processes. These guidelines are also followed for the waterway infrastructure in the Netherlands. On board: vibration sensors from ifm

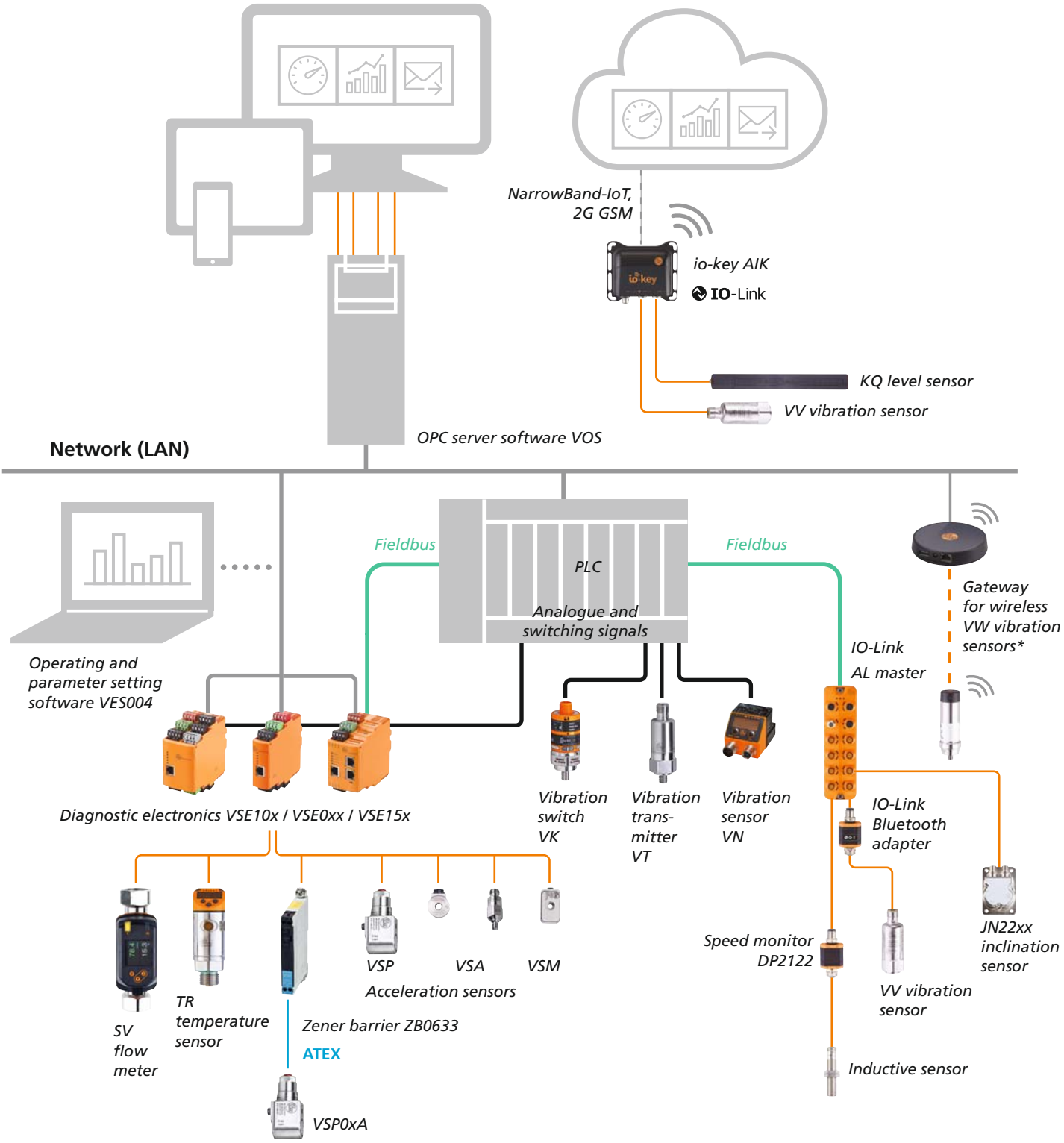


GKN Aerospace.

The Swedish company GKN Aerospace from Trollhättan produces high-precision parts for aircraft engines and for aerospace industries. The machine tools have sensors that ensure maximum transparency and highest product quality.

Would you like to learn more?

Systems for vibration monitoring. From sensor to ERP.



*The gateway for wireless vibration sensors and the wireless VW vibration sensor are excluded from the 5-year warranty.

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